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ABSTRACT

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by
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Paulo Freire's Legacy for Adults Learning Mathematics

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Abstract
The death of Paulo Freire in May 1997 was a momentous event for educators everywhere, especially adult educators, and a sad one for those who knew and loved him. I have been thinking and writing about Freire's work for many years, exploring his contribution to a radical politics of adult education. While Freire's work features strongly in debates about education and adult education generally, and about adult literacy in particular, his significance for adult numeracy/mathematics educators has been less discussed. In this paper, I shall try to redress the balance by considering the legacy of Paulo Freire's work for adults learning mathematics - and for teachers of adults learning mathematics, through a brief look at two very different developments in adults' mathematics education, both taking Freire as a starting point: Marilyn Frankenstein's work with adults learning mathematics in the USA and the REFLECT programme of development education.

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Introduction
Paulo Freire died on May 2, 1997, aged 75. He was a contradictory and charismatic figure who seems to have both resisted and exploited his status as a guru of radical education. His 'pedagogy of liberation' has had a tremendous impact in many parts of the world, but often without much clarity as to what the political purposes of education should be, except in the most general and rhetorical terms and his ideas have often been honoured more in the breach than in the observance. He is of huge symbolic importance to the marginalised field of adult education but he is a symbol interpreted in very different ways by his many admirers and by those who resist his appeal. Discussion about Freire is both polarised and very personalised, he is often discussed in terms of his personal qualities - his sincerity, his humility - and commentators seem either to love him or hate him. Unusually, in the field of education, his photograph appears in many of his books, contributing to his image as a sage and a teacher. It is an image which is constantly recycled; for example, the same portrait photograph, reversed, appears on the cover of The Politics of Education (Freire 1985) and on Letters to Cristina: Reflections on My Life and Work (Freire 1996). Freire also recycled and reinvented the titles - and sometimes also the texts - of his books and articles, for example, The Politics of Education (Freire 1985) is a collection of mainly previously published articles, including his 'Cultural Action and Conscientization' from Cultural Action for Freedom (Freire 1972a); his Education: The Practice of Freedom was originally published in English translation as Education for Critical Consciousness and comprises two essays first published in 1967 and 1969 in Portuguese and Spanish, respectively. His work has been translated - and sometimes re-translated - into many languages. His best known book, Pedagogy of the Oppressed (Freire 1972b; 1995a), is regarded by many as inspiring and by many others as unreadable and obtuse. Freire's life has been mythologized - indeed the word 'myth' has been used of Freire by several commentators. Pierre Furter (1985:301) describes him as "a myth in his own lifetime" and Kathleen Weiler (1996) has written a perceptive article entitled 'The Myths of Paulo Freire'. The most authoritative 'reading' of Freire to date, Paul V. Taylor's critically sympathetic 'bio-text', indicates areas of myth, hiatus and conflicting information in a variety of published sources, some apparently sanctioned by Freire himself (Taylor 1993).

I have explored the complexities and contradictions of Freire's contribution to a politics of adult education in my forthcoming book, Radical Heroes: Gramsci, Freire and the Politics of Adult Education (Coben, in press). In this paper, while drawing on that book, I shall focus on Freire's legacy for adults learning mathematics. Given that Freire had little to say about mathematics *per se*, what does his 'pedagogy of liberation' mean for adults learning mathematics? Freire is renowned as the initiator of an original and (it is claimed) highly effective literacy technique - is his method applicable to mathematics? The answers to these

questions are not immediately obvious and if we turn to the literature for help we find little discussion in this area. Much of the comment on Freire's work has been in the field of education generally, or in adult education, particularly in adult literacy, ignoring or subsuming the poor relation, 'adult numeracy'.

In order to find some answers to these questions, I shall first outline the main points of Freire's 'pedagogy of liberation', before turning to look briefly at two very different developments in adults' mathematics education, both of which take Freire as a starting point. These are Marilyn Frankenstein's work with adults learning mathematics in the USA and the REFLECT programme of development education in what Freire would call the 'Third World'. Finally, Munir Fasheh's moving and powerful account of his changing understanding of mathematics and of his role as a teacher in the West Bank and the Gaza Strip in the 1970s, in which he draws on Freire amongst others, is reprinted here as a coda.

Freire's Ideas

Let us start with a review of some of the ideas for which Freire is famous. Perhaps the best known term, and the one most immediately associated with Freire (although not invented by him) is *conscientização*, usually translated as 'conscientization'. Conscientization is an elusive concept in Freire's writing, often - although wrongly, in my view - equated with the second-wave feminist practice of consciousness raising. Freire uses it to denote his education process, stating that it "represents the development of the awakening of critical awareness" (Freire 1976:19). This 'awakening' he envisages as the outcome of guided progress through various stages of consciousness, a process which he describes in Education: The Practice of Freedom (Freire 1976) and Cultural Action for Freedom (Freire 1972a). The lowest level of consciousness Freire describes as 'semi-intransitive consciousness', characteristic of people trapped in the 'culture of silence', unable to discover and articulate their view of the world and therefore unable to act to change it. As people emerge from the semi-intransitive stage of consciousness, they enter what Freire terms the 'naive transitive' stage, from which there is a danger they may lapse into 'fanaticized consciousness'. The goal of conscientization is a more fully human state of being, which Freire calls 'critically transitive consciousness'.

Freire adopted the Marxist term 'praxis', signifying the interrelationship of theory and practice. He insisted that education is political praxis, and that his is a 'pedagogy of liberation', necessary for the victims of oppression. He counterposed his pedagogy of liberation with the repressive pedagogy of domestication - an example of a device that recurs throughout his work, that of presenting pairs of opposing elements. In a related pair of opposites, 'banking' education is set against 'problem-posing' education - banking education indicating an approach in which the teacher 'deposits' knowledge in the student, rather as one might deposit money in a bank vault, and problem-posing education indicating active engagement on the part of both teacher and student. It is not difficult to see which of the pair Freire approves of - clearly, banking education is bad and problem-posing education is good. The latter is characterised by dialogue, a term Freire uses to mean a deep spiritual communion between teacher and learner, inspired by love. Freire is very insistent that the teacher must love the students.

At an Adults Learning Maths conference we should perhaps remind ourselves that Freire is concerned with the 'word', and not the 'number' or the 'mathematical concept', and of course, a preoccupation with the word may seem entirely appropriate for one who is renowned for his literacy technique. Taylor (1993), points out that the 'word', for Freire, is a noun not a verb and that nouns are about naming the world, not changing it. He sees this as symptomatic of the limitations of Freire's method and it is hard to disagree. But perhaps I should have written 'Word' as it would then have had entirely appropriate Biblical resonances. Freire was a practising Catholic: for him, the word is arguably the Word of God and the education process, while making people more fully human, may also bring them closer to God. His pedagogy of liberation is also a pedagogy of hope - the title of one of his later books (Freire 1995b) - hope for the students, but also hope for humankind as a whole: his is perhaps as much a pedagogy of redemption as a pedagogy of liberation.

In order to achieve dialogue, love, hope in the educational setting, the educator must commit 'class suicide' and go through what Freire calls an 'Easter experience' - 'die' (at least metaphorically) and be born again. Class suicide is necessary because Freire assumes that the educator and the student come from different class backgrounds - hardly an unreasonable assumption, in many cases - but Freire's solution to this problem requires the teacher to sacrifice his or her class identity for the student. Interestingly, class suicide and the Easter experience are seldom discussed, except in the more specialist areas of the literature looking at Freire as a religious thinker, but I believe these are crucial to understanding Freire's thought and that they are at the root of the weakness in his methodology. Freire should be seen in the context of the movement from which his thought and his practice emerged: the coming together of forms of Marxism and forms of Catholicism in Liberation Theology in Latin America. Often called an eclectic - with much justification, as he draws on a wide range of thinkers from very different philosophical traditions, he is in fact a deeply syncretic thinker, in keeping with that aspect of his Catholic heritage. Perhaps this explains why his disciples are able to take from him what they like - the left takes the parts that sound Marxist and Christians take the parts that sound Christian. Small wonder then that comment and debate on Freire's work is so fragmented and that he has inspired such markedly diverse practice, as we shall see below. First we shall look at some of the strengths - and problems of Freire's education process.

Freire's Education Process

There is more to Freire's education process than his literacy method, but as it is probably his best-known and most concrete contribution to educational practice, and as space is limited, I shall focus on it here. He originally developed his literacy method in Brazil in the period prior to the 1964 coup which led to his 16-year exile. Material was lost in the coup and his method has been reconstructed after the event, consequently there is some confusion about what actually happened in this, the classical Freirean literacy campaign. However, Freire described the method in his books, Education: The Practice of Freedom (Freire 1976) and Pedagogy of the Oppressed (Freire 1972b; 1995a). According to these accounts, investigators work with the people to analyse their situation and identify 'generative themes' and 'generative words' - themes and words which are particularly meaningful and words which are syllabically fruitful (i.e. they can be deconstructed into their separate syllables and reconstructed in new combinations to form new words, exploiting the fact that Portuguese words are composed syllabically). That information is then 'decoded', culminating in the presentation of 'codifications' - slides depicting representations of the 'people's reality', which form the basis of the educational programme, thus it is intended that the content through which literacy is acquired should be familiar, relevant and challenging.

Copies of some of the 'codification' slides from Freire's literacy programme are reproduced in Education: The Practice of Freedom (Freire 1976) and they demonstrate both some of the strengths and some of the problems with Freire's method. For example, one slide depicts a barefoot man in the foreground with a book in one hand and a hoe in the other, standing on the edge of a plot of cultivated land. In the background there is a house and a well and a woman, walking away from the viewer towards the house, holding a small child by the hand. While there are many ways in which this picture could be interpreted, some of which are discussed below, Freire states in the text: "Through the discussion of this situation - man as a being of relationships - the participants arrive at a distinction between two worlds: that of nature and that of culture" (Freire 1976:63). The same point is presumably intended to emerge from a series of three images showing first, a man in 'European' dress with a gun, shooting birds, second, a 'native' man with a bow and arrow, also shooting birds, and third, a cat surrounded by dead birds. Presumably the cat is 'nature' - it is certainly an efficient hunter, as shown by the dead birds, but it has no culture. Presumably the man with the gun has culture - he is part of the culture that produced the gun - but what about the man with the bow and arrow? Is he part of 'nature' or 'culture' or does he represent some transitional stage between the two? More broadly, is it possible to identify and then 'represent' someone else's 'reality' so categorically? Who selects the images? On what grounds? How are the images presented? Who reads them? How are they read? Freire seems to be saying that the codifications are susceptible to only one interpretation: his own, and he seems oblivious to the possibility of sexist and racist readings.

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There is a further problem with Freire's education process: it aims to lead people through different stages of consciousness in order to become more fully human by achieving 'critical consciousness', to become 'conscientized'. But if some people have a lower level of consciousness than others and if 'conscientization' is a process of 'humanisation', the disturbing corollary is that some people are less human than others, and that the Freirean educator is to be the judge. With respect to the 'hunters' series, is the man with the gun more fully human than the man with the bow and arrow? Taylor's analysis of the image of the man with the hoe and the book is illuminating (Taylor 1993:86-92). He points out that the image endows the book with a totemic significance, while the hidden agenda is to ensure that the participants arrive at an understanding of the distinction between nature and culture. This, he says, is manipulative, an example of pedagogic bad faith, in which the peasant is enlightened because he or she has been judged to be in the image and likeness of the teacher (Taylor 1993:89). Freire does not appear to recognise this problem, which strikes at the heart of his methodology. Similarly, in the discussion of this paper at ALM-4, Roseanne Benn pointed out that in the same image, the woman is 'domestic' and the man with the hoe and the book is emancipated and facing out into the world: domestication has very strong connotations of women and children and the implication is that domestication is bad. Alison Tomlin responded that as a literacy worker in the 1970s, Freire's rejection of 'domestication' was one of the reasons for his popularity; conscientization was seen as a form of consciousness raising, familiar from feminist practice and

> the currency of feminist debate then was around the horror of women's lives. It is only recently that feminists have admitted that bringing up children is an OK thing to do; in the 1970s it was not.

The unschooled people who are rescued from domestication through conscientization are celebrated in Freire's work, but always anonymously, as in the statements from unnamed participants in the culture circles quoted on the cover of Education: The Practice of Freedom (Freire 1976): "As flowers they are nature. As decoration they are culture"; "I want to read and write so I can stop being the shadow of other people". These statements are undeniably moving - but who was speaking, in what context were these statements made? The people who are named by Freire are the academics, the investigators; by contrast, the students are 'a man from [such and such a place]', occasionally, 'a woman from [somewhere]'. The leader/led, teacher/student relationship for Freire is unequal, in direct contradiction of his insistence on the reciprocity of the pedagogic relationship and the love that he insists on between teacher and student is sacrificial. His notion of the culture of silence is also deeply problematic. As I have argued in my book (Coben, in press), how does Freire know that such statements were not made before the investigators arrived? Perhaps it is not so much that the people were silent, more that what they were saying was not heard. Alison Tomlin spoke of her attempt to relate Freire's concept of the culture of silence to Mao Zedong's idea of 'learning from the people':

> I remember discussing how you could put together Freire's concept of the culture of silence and silence as not speaking and the Chinese Cultural Revolution, which, put extremely crudely, was about silencing the teacher in order to listen to the student.

As I explain in my book, the coincidence is not accidental: Freire was strongly influenced by aspects of Maoism, and Mao's Cultural Revolution drew directly on some of Freire's ideas, a connection little discussed in the anglophone literature, even by leftwing commentators on Freire, who tend to see him as a Marxist in the European tradition, rather than a Maoist.

In my view the fundamental problem in Freire's work is the inadequacy of his notion of power. It seems to me that if you say that education is political, as Freire does, you have to have a concept of power, you have to have thought about what power is, how it operates, who has it, who has not got it. Freire has been criticised, not only by me, for having a very simple model of oppressor/oppressed; powerful/powerless (again, note the oppositional pairs). His notion of oppressor/oppressed takes no account of the fact that one can be both oppressed *and* oppressor. If education really is empowerment, it seems to me that you need more than a simple 'two-stroke' model like this in order to get to grips with what is really going on in people's lived experience (which is what Freire claims his method does).

The issue of power articulated through language is also fudged in Freire's work - for someone who is famous for his work in literacy this is a serious problem - for example, whose language should be used in the literacy campaign (a problem, also, in numeracy work)? This was a very difficult issue for Freire in Guinea-Bissau, where he went along with the post-colonial government's decision to use Portuguese (the language of the erstwhile colonisers). He regretted this decision and argued against it in private at the time, but did not reveal his misgivings until years later, and then said that he would still have accepted the government's decision (Freire and Macedo 1987:chapter 5). Similarly, there is a hiatus in Freire's thought on issues of gender. He has been criticised for this by feminists (see, for example, Weiler, 1994), and his response was to reissue Pedagogy of the Oppressed (Freire 1995a) attending to sexist issues of language by, for example, replacing the generic masculine form with 'he and she', but not attending to sexist issues of the whole construction of his thought. There is also, as we have seen, a hiatus in Freire's thought in relation to race, culture and ethnicity and Freire has been frequentlly criticised for his lack of a class analysis. How can issues of power be understood without considering the formations through which power is articulated?

The distinction between nature and culture carries the important message that situations can be changed through human agency. But in order to change things effectively, more is needed than an awareness of the possibility of change, what is needed also is an analysis of the stuff of politics: power. If 'education is political' it is necessary to think what politics might mean in particular situations. In situations where politics is a matter of life and death this is even more acutely necessary, but here Freire has little to offer. The logic of his politics is that the leader is the analogue of the teacher: people must trust their Freirean, self-sacrificing leader, just as the students must trust their Freirean, self-sacrificing teacher to have integrity, to have committed class suicide, to be sacrificing himself or herself to their cause. I regard that as naive, irresponsible, potentially extremely dangerous - in a real revolution it is a recipe for a high body count. Freire has a vision of liberatory politics which rolls on with its own momentum but it is terribly exposing - not necessarily for the educators, who may be away 'investigating' and 'conscientizing' somewhere else, but for the people who have been 'conscientized' and want to take action to change their world. In place of organisation, analysis, theory, experience, all Freire has to offer is the message, 'Trust your leader'.

So what is Paulo Freire's legacy for adults learning mathematics - and for teachers of adults learning mathematics? I shall turn first to the work of one such teacher, Marilyn Frankenstein, in the USA.

Developments from Freire in Mathematics/Numeracy Education

A glance at some of the headings in Frankenstein's book Relearning Mathematics: A Different Third R - Radical Maths (Frankenstein 1989) tells us something about her approach: Part One is headed "Mathematics: anxiety, anger, accomplishment", with a sub-heading "Mathematics anger: mathematics is not useless and boring", Part Two covers, "The meaning of numbers and variables". The focus on affective, emotional responses to mathematics, on meaning in mathematics and on mathematics as a tool for understanding the world, are all strong features of Frankenstein's work, as is her refusal to duck politically sensitive issues. She makes extensive use of material from newspapers, advertising and official reports to explore contentious issues such as arms control, racial discrimination and the unequal distribution of wealth, and her book includes many sharply satirical political cartoons.

There is much in Frankenstein's book which is quite a long way from Freire - including of course the cartoons - these are not the products of Freirean investigations - but she acknowledges her debt to Freire, in her book as well as in her article, 'Critical Mathematics Education: An Application of Paulo Freire's Epistemology' (Frankenstein 1987) and her chapter, written with Arthur B. Powell, 'Toward liberatory mathematics: Paulo Freire's epistemology and ethnomathematics' (Frankenstein and Powell 1994). In her chapter with Powell, the strong points of Freire's epistemology are encapsulated as: his insistence that "knowledge is not static, that there is no dichotomy between objectivity and subjectivity, or between reflection and action; and knowledge is not neutral"; thus, "Knowledge does not exist

apart from how and why it is used, and in whose interest"; for Freire, "people produce knowledge to humanize themselves" (Frankenstein and Powell 1994:75,76).

Frankenstein's work seems to me an important contribution to Freire's legacy in three major respects: first her insistence that knowledge is not neutral is a necessary counterbalance to the prevailing view of mathematics as objective, fixed, immutable; second, her use of challenging, politically sensitive material as a vehicle for teaching mathematics is a necessary counterbalance to the prevailing functionalist approaches, based as they all too often are, on a very limited view both of the nature and functions of mathematics and of the roles of adults in the modern world; third, and perhaps most importantly, in her passionate commitment to the values which suffuse Freire's work - his concern for the oppressed, his commitment to education for the liberation of human potential and for social change. Freire, then, may be seen as lending legitimacy to Frankenstein's outspoken, creative and oppositional approach to teaching mathematics to adults. But could other authorities be cited for her work? I think they could. Freire, after all, did not originate the idea that knowledge is not neutral; he is not alone in insisting that education is political; his view of education as a humanising process is common in the romantic tradition from Rousseau onwards. Frankenstein is well aware of criticisms of Freire, for example by feminists such as Kathleen Weiler, and, in a recent conversation with me, confirmed that she agrees with much of them. Freire's dualistic political vision and his glamorisation of the teacher are as unhelpful in mathematics education as they are in literacy work and neither features in Frankenstein's work, which is original and exciting in its own right.

Why, then, does Frankenstein cite Freire in support of her approach? I think this reflects, at least in part, Freire's symbolic importance to adult educators: he is a beacon - a "radical hero", as I have argued in my book - for oppositional practitioners and theoreticians alike. In a field riven with internal dispute, it becomes imperative to situate oneself politically in relation to Freire. It is also, I think, a reflection of the syncretic nature of Freire's thought, referred to above, since that enables Frankenstein to take from Freire the ideas that suit her purpose and leave the rest - there seems little danger of her committing class suicide, for example. My concern is that the theoretical weaknesses in Freire's work, some of which I have outlined above, may undermine the development of theory and polarise debate in the field of adults learning mathematics, as, arguably, has already happened in the wider field of adult education. Freire's very syncretism, while enabling his followers to "cherry-pick" the ideas that suit them, also makes it very difficult to conduct a cogent discussion of his work, since people often find themselves at cross-purposes. A measure of the range of interpretations that result may be gauged by my second example of a Freirean development in the field of adult mathematics education: the REFLECT programme.

REFLECT

REFLECT stands for "Regenerated Freirean Literacy Through Empowering Community Techniques". It is an approach to education amongst the poor of the world developed by the British non-governmental organisation (NGO), ACTIONAID and the UK government's Overseas Development Administration and launched in 1996 by Linda Chalker, Minister for Overseas Development in the then Conservative UK government. REFLECT brings together some aspects of Freire's techniques and rather more techniques from Participatory Rural Appraisal (PRA), a process developed by Robert Chambers (1983; 1993) which is well-established in the field of development education. While not specifically a mathematics education programme *per se*, REFLECT techniques highlight mathematics, unlike the "classical" Freirean literacy techniques reviewed above.

The idea is that people come together with a coordinator (someone from outside - an echo of the problems outlined above in the discussion of Freire's "investigator/teachers") and map their geographical location, their "community". This raises all sorts of questions about what is meant by "community", but REFLECT does at least offer a set of techniques which could be used to explore that question and other questions of power: race, gender, etc., on which Freire is weak. The REFLECT approach also involves participants *as co-investigators*, rather than as consumers of the codifications prepared by outsiders, as in Freire's approach. Freire, Frankenstein and REFLECT all use graphical representation, although in different ways, which

I think in itself is interesting. Many people, when they hear the word "mathematics" or "numeracy", probably think of "sums", but one would not immediately think of "sums" when looking through the REFLECT Mother Manual (Archer and Cottingham 1996a) - or, indeed, Frankenstein's (1989) book, both of which contain a wealth of visual material, and Frankenstein also makes good use of images of artwork, including sculpture and painting. The graphics in the REFLECT manual are rather more prosaic than those in Frankenstein's book - it contains representations of diagrams, maps and calendars made in the course of mapping the environment and resources available to any given community. The REFLECT technique brings people together in order to look at where they are, who they are and what resources are available to them (reflecting its roots in PRA). It involves mathematics at the heart of the process, since, for example, counting and measuring will have gone on in order to establish how many people live in a particular village, where the river flows, and so on. Similarly, a health calendar records seasonal variations in health and disease, plotted over a year, alongside a record of cropping patterns and a grid shows sources and uses of credit - a hot topic in poor rural communities, for obvious reasons. For each of the graphic images represented in the manual there is a section on numeracy and this is very welcome, since, as I have said, numeracy is often subsumed within literacy or ignored altogether. REFLECT has not yet been independently evaluated, so it is not possible to comment on its effectiveness in practice (ironically, this is also true of many other so-called Freirean projects, including those in which Freire was directly involved). An interim evaluation has been undertaken by ACTIONAID itself in three REFLECT pilot projects in Uganda, Bangladesh, El Salvador (Archer and Cottingham 1996b) and the results are deemed to be encouraging.

But the Freire who inspired REFLECT is very different from the one who inspired Frankenstein's book. REFLECT is hardly oppositional and certainly not Marxist, neither is it particularly Christian: it is about helping poor people to gain a better foothold within the existing capitalist system, not about changing the system, although, like any other approach it could no doubt be subverted for oppositional ends, that is clearly not the intention of ACTIONAID or the British government. It is, however, open to the same accusations of naivety that I have levelled against Freire: as Kathy Safford pointed out in the discussion at ALM-4, the technique raises the question

> "why does this person want me to count and reveal information about my household?". It ties in with something that we encourage our teachers to do in the States, we encourage them to use a lot of statistics. This becomes an issue when you are working in a neighbourhood where there are unregistered "invisible" people, the teacher can be viewed as being nosey when she was perhaps trained in a white middle-class college where it didn't occur to her that it might be considered wrong for a child to reveal that information or that she might in fact be seen as tricking them into revealing it. I thought rather the same thing with that. As soon as you put a map up and you count people in the house, I'd ask: "Where is this going?"

I agree. It seems to me that what is missing in REFLECT, as in Freire's own work, is an understanding of power. Without it, educational intervention based on his ideas will be ameliorative at best and invasive and irresponsible at worst. Without an understanding of power it is all too easy to view as one homogeneous "community" a group of people who may be divided in many important ways.

But whatever the weaknesses of REFLECT or any other Freirean programme, the striking fact is that Frankenstein's work and the work of the REFLECT teams are very different. On the face of it, it is hard to believe that they share a common root in Freire, but given the syncretic, eclectic quality of Freire's thought, perhaps it should not surprise us.

Coda

It seems fitting to give the last word to one who knows only too well that politics is about power: Munir Fasheh. His moving account of his work in the West Bank and the Gaza Strip in the 1970s is quoted in Marilyn Frankenstein's book (1989: 57-9). It is reprinted here, with permission, as a fitting coda to this discussion.

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When structures fall people rise

When I returned to Birzeit in 1971, I was filled with energy in two different directions: the one, to expand the use of logic and science in the world through teaching, and the other, to deal with what we experienced as an attempt to dismantle the Palestinian community as a viable entity. Opportunities in mathematics presented themselves almost immediately. While the Arab countries had already introduced the "New Math", the West Bank and the Gaza Strip, being under military occupation, had been left out. Birzeit organized a course for all the High School teachers in the West Bank in the summer of 1972. I ran that programme and helped to incorporate cultural concepts, independent exploration and effective engagement into the syllabus, to overcome the fundamentally dry, and alien abstraction of the math. Both teachers and students were enthusiastic about this revitalization of the teaching but it did not yet lead me to question hegemonic assumptions behind the math itself.

The Palestinian community I went back to was self-confident, energized, idealistic, and already involved in its own renewal, largely as a result of the development of the Palestinian movement. A group of us began children's programs in drama, arts, crafts, mathematical games, simple science experiments, poetry, music and literature, which developed and expanded quickly. We also began working voluntarily in other community projects. While these activities in the community involved joyousness, spontaneity, cooperation and freedom, they were not yet fully articulated for me as education and were not yet fully a praxis in Freire's sense.

While I was using mathematics to help empower other people, and while I was being empowered by the voluntary work, mathematics itself was not empowering me. It was, however, for my mother, whose theoretical awareness of mathematics was completely undeveloped. Math was necessary for her in a much more profound and real sense than it was for me. My illiterate mother routinely took rectangles of fabric and, with few measurements, and no patterns, cut them and turned them into beautiful, perfectly fitted clothing for people. In 1976 it struck me that the mathematics she was using was beyond my comprehension; moreover, while mathematics for me was the subject matter I studied and taught, for her it was basic to the operation of her understanding. What kept her craft from being fully a praxis (in Freire's term), and what limited her empowerment, was a social context which discredited her as a woman and uneducated, and paid her extremely poorly for her work. Like most of us, she never understood that social context and was vulnerable to its hegemonic assertions. She never wanted any of her children to learn her profession; instead she and my father worked very hard to see that we were educated and did not work with our hands. It was a shock for me to realise, in the face of this, the complexity and richness of her relationship with mathematics. Mathematics was integrated into her world as it never was into mine.

My mother's sewing demonstrated another way of conceptualising and doing mathematics, another kind of knowledge, and its place in the world. The value of my mother's tradition, of her kind of mathematical knowledge, while not intrinsically disempowering, however, was continually discredited by the world around her, by the culture of silence and cultural hegemony.

The discovery of my mother's math was a discovery about the world and relationship between hegemony and knowledge. Hegemony does not simply provide knowledge; it substitutes one kind of knowledge for another in the context of a power relationship. While I had been struggling to make the mathematics I had learned meaningful, the embodiment of what I was seeking was in front of me, made invisible to both my mother and me by the education I had been given, which she desired for me. It had been, in Freire's terms, an education for oppression, domestication and dehumanization. While I was not yet ready to question the theoretical bases of Western science and math themselves, the discovery allowed me to recognize the greater need for liberated education, to respect all forms of knowledge and their relation to action.

For me, this powerful statement has resonances that are as much Gramscian as Freirean, but insofar as they are Freirean, they are enormously strengthened by Fasheh's understanding of power relations and his deep respect for his mother's mathematical knowledge. His recognition

that the latter was "not intrinsically disempowering [but] continually discredited by the world around her, by the culture of silence and cultural hegemony" indicates a conception of the 'culture of silence' which is different from Freire's in that it is an active concept: Fasheh is talking about the process of *silencing*, not the state of *being silent*. It is the difference between the noun and verb forms, the significance of which Taylor picked up in his critique of Freire's literacy process, referred to above.

Ultimately, Freire's legacy will be judged by the use that is made of his ideas by those inspired by his vision and by the extent that his ideas contribute to, rather than inhibit, the development of theory and practice in adult education, including adult mathematics education. The jury is out.

Notes

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